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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/392,722	09/09/1999	TOSHIYA AKAMATSU	950637B	1679

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EXAMINER

GRAYBILL, DAVID E

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 09/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/392,722

Applicant(s)

AKAMATSU ET AL.

Examiner

David E Graybill

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 17-21, 25, 26 and 37-43 is/are pending in the application.
- 4a) Of the above claim(s) 17-21, 25, 26, 37 and 38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 39-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_. 6) ☐ Other: \_\_\_\_\_

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A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6-9-3 has been entered.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 39-43 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 39 there is insufficient antecedent basis for the language "the surfaces of the first and second electrodes."

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 39 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Behun (5147084).

At column 3, line 38 to column 4, line 62, Behun teaches a method for fabricating an integrated electronic device having an electric connection connecting a first electrode of a first substrate with a second electrode of a second substrate, the method comprising the steps of: forming first 18 and second 13 soldering metal bumps on the surfaces of the first 12 and second 17 electrodes, respectively, wherein a melting temperature of the first soldering metal bump is higher than a melting temperature of the second soldering metal bump; aligning the first and second soldering metal bumps to each other, and then keeping both in contact with each other; and heating the first and second soldering metal bumps to melt the second soldering metal bump at a temperature lower than the melting temperature of the first soldering metal bump without melting the first soldering metal bump and then cooling down to solidify the second soldering metal to form an electric connection between the first and second electrodes, wherein the first electrode is connected indirectly with the second soldering metal bump by way of the first soldering metal bump, and the second electrode is connected indirectly with the first soldering metal bump by way

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of the second soldering metal bump during the heating and subsequent cooling-down process, wherein the first and second soldering metal bumps essentially consist of an alloy of Pb and Sn, wherein Pb is contained less in the first soldering metal bump than in the second soldering metal bump.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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Claims 40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Behun as applied to claims 39 and 41, and further in combination with Hideshima (5143865).

As cited, Behun teaches wherein the surface of the second electrode has adhesive tendencies to molten metal.

However, Behun does not appear to explicitly teach wherein the surfaces of the first and second electrodes are made of Al and Cu, Au, Ag or Sn, respectively, and the surfaces of the first electrodes have repellant tendencies to molten metal.

Nonetheless, at column 1, lines 31 to column 3, line 30, Hideshima teaches a process wherein a surface of an electrode 3 inherently has repellant tendencies to molten metal, and wherein a surface of the electrode is made of Al. Moreover, it would have been obvious to use the Al electrode of Hideshima as the first electrode of Behun because it would provide the first electrode of Behun.

Also, as cited, Hideshima teaches a process wherein a surface of an electrode 3 is made of Cu. In addition, it would have been obvious to use the Cu electrode of Hideshima as the second electrode of Behun because it would provide the second electrode of Behun.

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Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Behun as applied to claims 39 and 41, and further in combination with Dudderar (5307983).

Behun does not appear to explicitly teach wherein the first soldering metal is formed in a trapezoidal shape by depositing a first soldering metal through a first mask.

Nevertheless, at 3, lines 11-63, Dudderar teaches a method for fabricating an integrated electronic device wherein a first soldering metal 7 is formed in a trapezoidal shape by depositing the first soldering metal through a first mask. Moreover, it would have been obvious to combine the process of Dudderar with the process of Behun because it would provide the first soldering metal in a predictable shape.

Applicant's amendment and remarks filed 1-8-3 and 3-10-3 have been fully considered, are addressed by the rejections *supra*, and are further addressed *infra*.

Applicant contends that Behun "does not anticipate the proposed amended claims" because allegedly, "the first electrode is connected directly with both the first and second soldering metal bumps 18, 13, during the heating and subsequent cooling-down processes."

This contention is respectfully deemed unpersuasive because the claims are not limited to a process wherein the first

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electrode is not connected directly with both the first and second soldering metal bumps 18, 13, during the heating and subsequent cooling-down processes.

Also, applicant argues that there is no motivation to combine the processes of Behun and Hideshima.

This traversal is respectfully traversed because motivation to combine is explicitly and clearly provided; namely, "it would have been obvious to use the Cu electrode of Hideshima as the second electrode of Behun because it would provide the second electrode of Behun," and, "it would have been obvious to use the Al electrode of Hideshima as the first electrode of Behun because it would provide the first electrode of Behun." To further clarify, it is well established that the selection of an art recognized element based on its suitability for its intended use supports a prima facie obviousness determination. See MPEP 2144.07, and *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945); *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious); *Smith v. Hayashi*, 209 USPQ 754 (Bd. of Pat. Inter. 1980) (There was evidence that both phthalocyanine and selenium were known photoconductors in the art of electrophotography. "This, in our view, presents strong evidence



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of obviousness in substituting one for the other in an electrophotographic environment as a photoconductor." 209 USPQ at 759.); and *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988) (Claimed agricultural bagging machine, which differed from a prior art machine only in that the brake means were hydraulically operated rather than mechanically operated, was held to be obvious over the prior art machine in view of references which disclosed hydraulic brakes for performing the same function, albeit in a different environment). In other words, even though the prior art already disclosed a brake, it was held to have been obvious to substitute the brake of the references for the brake of the prior art because it is obvious to select an art recognized element based on its suitability for its intended use. See also *Ex parte Jones*, 62 USPQ2d 1206 (BdPatApp&Int 2001), (The applicant and the examiner have apparently assumed that there always must be "motivation" to combine teachings of the prior art to support a rejection based on §103(a). The assumption is not correct. The word "motivation" or a word similar to "motivation" does not appear in 35 U.S.C. § 103(a). While a finding of "motivation" supported by substantial evidence probably will support combining teachings of different prior art references to establish a *prima facie* obviousness case, it is

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not always necessary. For example, where a claimed apparatus requiring Phillips head screws differs from a prior art apparatus describing the use of flathead screws, it might be hard to find motivation to substitute flathead screws with Phillips head screws to arrive at the claimed invention. However, the prior art would make it more than clear that Phillips head screws and flathead screws are viable alternatives serving the same purpose. Hence, the prior art would "suggest" substitution of flathead screws for Phillips head screws albeit the prior art might not "motivate" use of Phillips head screws in place of flathead screws. What must be established to sustain an obviousness rejection is a legally sufficient rationale as to why the claimed subject matter, as a whole, would have been obvious notwithstanding a difference between claimed subject matter and a reference which is prior art under 35 U.S.C. § 102. Once a difference is found to exist, then the examiner must articulate a legally sufficient rationale in support of a §103(a) rejection. The legally sufficient rationale may be supported by a reason, suggestion, teaching or motivation in the prior art which would have rendered obvious the claimed subject within the meaning of § 103(a). *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some *teaching, suggestion or motivation* in the

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prior art to make the specific combination that was made by the applicant); *In re Gartside*, 203 F.3d 1305, 1319, 53 USPQ2d 1769, 1778 (Fed. Cir. 2000) (the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a *teaching* or *motivation* to combine prior art references); *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996) ("there must be a *reason, suggestion, or motivation* \*\*\* to combine [the teachings of] \*\*\* references \*\*\*"); *Smiths Industries Medical Systems, Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1420-21 (Fed. Cir. 1999) (there is no basis for concluding that an invention would have been obvious solely because it is a combination of elements that were known in the art at the time of the invention; the relevant inquiry is whether there is a *reason, suggestion, or motivation* in the prior art that would lead one of ordinary skill in the art to combine the teachings of the references)).

Therefore, to paraphrase *In re Leshin* supra, selection of the Al and Cu electrodes of Hideshima to make electrodes of types made of metal as taught by Behun would have been obvious.

Applicant also asserts that there would not be a "reasonable expectation of success" with the combination of

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Behun and Hideshima because, "the same favorable result as shown in Fig. 1B can not be obtained."

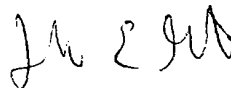
This assertion is respectfully deemed unpersuasive because the claims are not limited to the alleged same favorable result as shown in Fig. 1B, and the references are not necessarily applied to show the alleged result.

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

***Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.***

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is 703/3087724.



David E. Graybill  
Primary Examiner  
Art Unit 2827

D.G.  
5-Sep-03